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This resource pamphlet is intended to acquaint the Head Start teacher with the possibilities of teaching science in a preschool program for disadvantaged children. Introductory sections stress the importance of including science in a Head Start program, briefly indicate how to use the pamphlet, and suggest some things to seek and avoid. A section entitled "Some Things to Keep in Mind" presents objectives for a science program. These are (1) to use science experiences to develop language skills, (2) to provide opportunities for children to relate to adults, (3) to provide variety in the child's experiences, (4) to establish a sense of the order in the world, (5) to develop completion experiences, (6) to give the child a feeling of being able to solve problems, and (7) to diffuse elements acquired through science into the child's whole life. Suggestions for planning science activities are presented through three sample lesson plans. A final section lists readings for adults, books and records to use with children, and sources for filmstrips, films, books, and science materials. (DR)

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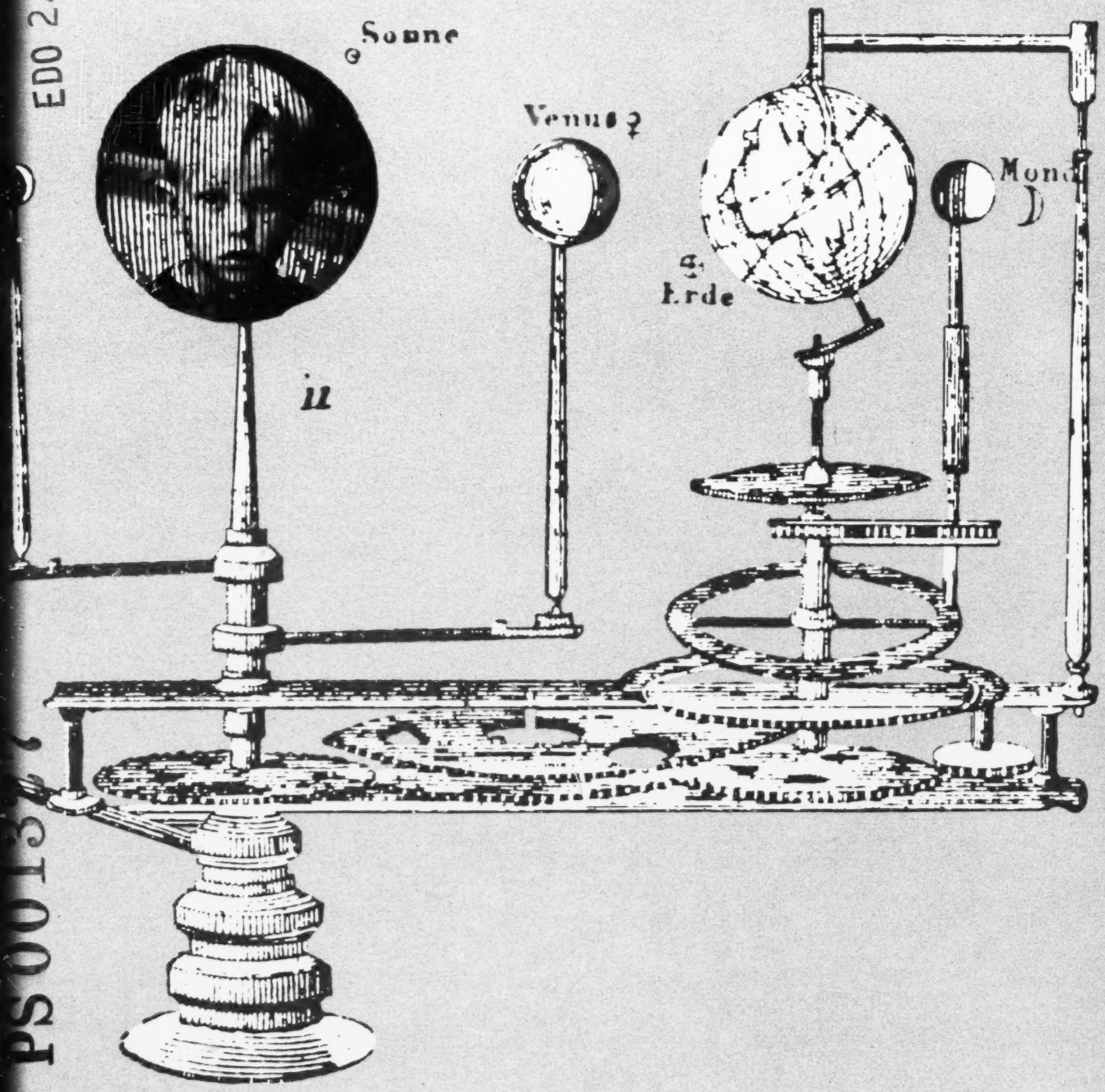

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why science

WHY is it so important
to include SCIENCE in a Head Start program?

BECAUSE science experiences are interesting and exciting and fun
science experiences awaken curiosity and wonder
science experiences encourage a child to observe, explore, inquire and generalize

BECAUSE the Head Start child needs to establish certainties about nature
that nature is not hostile nor magic
that nature is orderly and consistent and reliable
that in nature, a certain act always causes a certain event to occur

BECAUSE the Head Start child needs to realize
that he is part of nature
that he is a person of great value who has a place in the world

the Head Start child needs to use his senses,
needs to see, smell, feel, taste, and hear
more intensely than ever before

the Head Start child needs information
which will help him to understand his environment

the Head Start child needs to develop
a solid foundation of new concepts on which to
build his later learning

Why?

Is there such a thing as a jello grinder?

What came before everything else?

Does a gorilla know he's a gorilla?

Why does water make ice?

How does our brain work?

When I get a nosebleed, do my blood cells have empty seats?

Why does the rocket break off the capsule?

Is it very important to tell time?

Could a boy grow up to be a lady if he was a girl?

How does my hair get out of my head?

Why can't we look both ways at the same time?

What are lenses?

What are germs?

Does a kangaroo's pouch just grow there?

Are we made of melted wood?

Does a car see itself?

Can planes fly above the sun?

Where does air come from?

Can cars go faster than trains?

Do people have livers?

Has anybody ever figured out a little of what gravity is?

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"but I don't know anything about science!"

You probably know more than you realize. You will gain confidence if you prepare yourself carefully by exploring books and materials. An extensive list of both begins on page 19.

Books are essential. You will need books for your own background reading as well as books to use with the children. Before you make a book available to a child, be sure you know its contents.

Some science materials can be acquired just by taking a walk outdoors. But you will need to buy some, so our list includes some suggestions that will help you to choose wisely and economically.

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some do's and don'ts

Do have a Science Center: shelves or a table where children can display, look at, and pick up rocks, a bird's nest or a bug.

Do make science part of the daily experience. When Ricky brings in a leaf, help him show it to the class. Talk about its color and shape and how it feels.

Do use seasonal or weather changes to pave the way to discussing plant growth or cloud formation. Talking about thunder will make a storm less fearsome.

Do apply scientific principles to classroom situations. When the block castle tumbles, say, "Never mind, Bobbie Jo. Let me show you how gravity works. Then we'll build it up again."

Do relate the child to the science discussion: your state's river, the tree on David's street, soil from Rosario's schoolyard.

Do be cheerful, even if you're tired. Be interested, curious, even excited sometimes. Be open, responsive, and communicative all the time.

Don't treat experiments as if they were feats of magic. Science experiences are part of the real world where things happen for a reason. Help the children to see a cause-effect relationship. If you pour red water into blue water, you get purple water.

Don't set up rigid units of study to be completed in a given time. Have a plan, but let it be a flexible one. If the children lose interest after five minutes, don't prolong the discussion. If you had planned a ten-minute experiment that awakens a half hour of excitement, don't interrupt it.

Don't think of just the immediate moment. Plan science experiences that show the consequences of certain actions. Show the children how to anticipate a result, how to think and plan ahead. If you leave a piece of iron out in the rain, it rusts; if you leave a bar of soap in the water, it melts. Ask the children if they know what to expect. When it happens, call it to their attention.

Don't try to teach everything. Choose certain subjects that you think would be valuable to your particular group.

Do perform experiments in small groups, not large groups. Stand the children around the table where each one can see.

Do encourage every effort, even the unsuccessful ones. A science experience like using a prism to bounce sunlight about the room has success built into it. Be sure each child is successful sometimes. Be sure he knows he has had a success.

Do call the child by his name. Sometimes use both his first and last names.

Don't overlook the hobbies and talents of parents. Ezekiel's mother might be invited to show the children how to make jello or feed puppies. A field trip might be arranged to visit Juan's father's garden.

Don't just establish facts. Our goals are to extend experience, stimulate awareness, learn to solve problems, and develop curiosity, not to "get the right answer."

Don't use dangerous equipment that may cut, burn, or shock.

Don't be afraid to say, "I don't know." Nobody knows everything. But remember to take the child's question seriously, and try to find out for him.

Don't let one child dominate the group. The quiet ones are probably just as interested. Let them know you are aware of them.

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some things to keep in mind

A favorite toy in Sammy's Head Start classroom is a wooden train, whose multicolored cars couple and uncouple. Sometimes Sammy pushes just the locomotive along the track, but what satisfies him the most is to hook up all the cars at once, as many as 10 or 12 at a time, plus the red caboose.

Let's think of Head Start science as a toy locomotive. Like Sammy, we could use it all by itself, doing an occasional experiment just to pass the time, expecting colored water to be the only result. Or we can use our science locomotive to pull a full load. We can think of science as a vehicle for confronting some specific needs which are common among Head Start children.

Language development is one car to which we can couple our science experiences. A Head Start child may not be in the habit of asking questions and receiving answers. Perhaps he isn't equipped with the words he needs to form a question. Perhaps he doesn't know the names of things. He may not be aware that words are used for sending and receiving information. He may not be used to hearing or participating in prolonged conversations which are centered around a certain subject. Perhaps he is not used to listening for directions and then acting upon them. He may not realize that the idea he has in his head could be communicated to others, if he knew the proper labels. Science experiences are useful in attacking all of these language problems.

Suppose you have a small group of children standing around a table. On the table are magnets and little objects like paper clips, buttons, nails, crayons, and safety pins. Because the children are interested in magnetism, you can turn the science experience into a very fruitful language experience. Seek out every child; catch his eye; call him by name. Which things (name them) does the magnet (name that, too) pick up? Can the magnet work through paper? Through a glass? What do magnets do to each other? Draw out questions and guesses. "Jerry, point to the things the magnet didn't pick up. Let's say their names." "Do you think the

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magnet will pick up chalk? Why not?" Help the child to form questions, but if he doesn't have the vocabulary to do this, then try to discover what his unasked question is. That he doesn't have the words doesn't mean that he doesn't have the question.

Another car to couple to our science locomotive is the children's need to relate to an adult. Every child needs an interested, uncritical grown-up around him. In this role, in the context of science, you may be the startled receiver of questions about sex, death, or other life facts. If you have animals like puppies or guinea pigs in your classroom, it is to be expected (even hoped) that these questions will come to the children's minds. Be prepared for them. Don't try to distract the child to another topic. He is entitled to as much of the truth as he is able to cope with. Receive the questions just as you would any other question: warmly, openly, uncritically. Have information ready in your own mind. See the bibliography on page 19 for some reading suggestions.

It can be very tiring to relate to young children. It is natural for them to think of themselves, not of you or whether you've had a coffee break. Be as generous with yourself as you can, remembering that for some of the children, you may be their only source of adult attention. Many disadvantaged families find it necessary to leave young children in the care of older children, in order for both parents to work. As a teacher or aide, you are not a substitute parent, of course, but you are an adult, and your interaction with each child is very important indeed.

In our line of cars, let's include the Head Start child's need for a great variety of experience. The children need to be involved with real things, and science is perfectly suited to meet this need. Real shells, real rocks, real soap bubbles, real flowers, real fish, all need to be touched, smelled, seen (through a magnifying glass?), listened to, and some need to be tasted. Natural phenomena like wind, rain, temperature, need to be experienced. "Are your hands wet? Cold? Is the stone rough? Smooth?"

It's a good idea to leave science articles out where the children can examine them at any time and add to the collection. To the colorful shells and ears of corn, the hickory nuts and acorns, provided by you, will be added the leaves, the bugs, and the hunks of concrete provided by the children. Be sure to remove articles when interest in them lags. Keep the Science Center "fresh."

Take advantage of the variety of experience offered by a single object, like a pine tree. Show the children first the real object, then talk about its name. Point out its parts; talk about their names (branches, trunk, needles, pine cones). When you go back indoors, show a picture of a pine tree. Ask them which of their senses perceived the real tree (seeing, smelling, touching, hearing if it's a windy day), and which senses perceive the picture of the tree.

Still another car for our science locomotive to pull is the Head Start child's need for a sense of order. We have to be careful not to sacrifice order for variety. Some of your children may not be aware of the world as an orderly place. Perhaps a child has few belongings that are his alone and to which he can relate. Perhaps his family doesn't sit down all together for breakfast or supper. Perhaps the members of his family come and go unexpectedly and at irregular intervals. It is possible that his immediate environment obscures for him the fact that nature has patterns.

Science experiences should be related to each other as in the pine tree experience; we don't want to fire a barrage of random facts at the Head Start child. He needs to be shown how each separate science experience fits into the whole of his life experience. He needs to become aware of natural phenomena in relation to other natural phenomena, and he needs to be aware of himself in relation to nature. He needs to see examples of cause-effect relationships, like heat boiling water or cold forming ice. He needs to see the way certain things happen in sequence, like tadpoles becoming frogs or like flour, eggs and butter becoming cookies. He needs to see how things relate to the space they fill, like a quart of milk becoming

four cups of milk or like many little pails of sand becoming a boxful.

Order is necessary for developing these awarenesses, but we can have variety, too. The secret is in planning. It is helpful to arrange your science activities into broad categories. You might try activities with living things (flowers, turtles, bugs) and non-living things (rocks, weather, magnets). Or you might try more specific categories like weather, animals, plant life, or water. Some suggestions for week-by-week planning can be found on page 11.

The Head Start child's need for completion experiences is another car well suited to our science locomotive. Suppose you have a small group using inflated balloons. You want each child to notice that when he rubs the balloon on his arm, he can make it stick by static electricity to the wall or to his friend's back. He can make his hair stand up. He may even see sparks if you take the balloon into a dark closet. Of course, he will want to bat the balloon around, but before he does that, point out the things he should notice. Have him succeed in doing and seeing. Let him know he has accomplished something.

Giving a child a sense of problems being solvable is still another car that fits nicely onto our science train. The problem is to make a pinwheel, to close your eyes and pick out a comb from a trayful of objects, to pick up a heavy box with a lever, to make a seed grow in wet cotton. How do we solve the problem? Let the children guess and experiment. Be sure they know it when they succeed. If they don't succeed, help them to learn from the failure. Why did the bean rot in the soil? Too much watering? Not enough? Both success and failure can be learning experiences. If a child succeeds, praise him; if he doesn't, encourage him. A skillful teacher uses both successes and failures to lead to future successes.

Sammy's train has a caboose, and so does our science train. Let's call it diffusion. It can be coupled on only by the children themselves. Each child must recognize that science isn't something that he does at the science table. New concepts, new attitudes, new powers of

observation, new curiosities, new skills which they have acquired through science experiences must go home with the children. This newness must diffuse into the child's whole life, so that when he is at home, away from your influence, he will of his own newly kindled interest, carefully watch a snowflake land on his sleeve. He will lie flat on the sidewalk to follow a spider's progress. He will wait to see what color the sky will be when the sun sets. He will all by himself think of showing his mother the veins in a leaf or explain to his younger brother that although there are clouds in the way, the stars are still there.

planning your science activities

Some of your most successful science experiences will be the unplanned ones. Anna Mae brings in a rock she found on the way to school, so you discuss the rock. The wind rises suddenly, blowing leaves and dust around, so you discuss the wind. An ant moves across the sand box, tugging a load twice its size, so you discuss ants.

Spontaneous adventures like these are exciting and important. You will want to make the most of them when they come along, by showing pictures of rocky beaches or reading a book about ant colonies. They teach the children facts, and they show that science is everywhere, for every day.

However, you can't depend upon Anna Mae's rock, the high wind or the plucky ant. They might appear all at once or even not at all. A lesson plan prepared in advance will give you the security of knowing exactly what you're going to do next. Your fellow teachers can read it and know, too, so you won't have to make your plans in the presence of the children. If you have to take time out to confer with the other adults, you may lose the attention of the children. What you need is your own base of action around which you can develop class activities. Try something like this:

THEME: Seeing, Hearing, Smelling, Touching, and Tasting
(A theme for the week will give you something to build around.)

Some Understandings

(These are the concepts you want the children to comprehend.)

I can see, hear, feel, smell, and taste wonderful and fascinating things around me.

I can explore, examine, investigate, and wonder about the world.

Experiences

(Experiments like these offer concrete examples of the concepts.)

Dissolve jello, baking soda, flour, sugar, and cornstarch in paper cups half-filled with water.

Taste and smell harmless household substances like vinegar, corn oil, vanilla, or salt.

Fill bottles with different amounts of water, and blow across the tops. Listen to the variation in tones.

Pour colored water into measuring cups, funnels, pitchers. Combine different colors to make new colors.

In a large pan of water, place a sponge, a cup, a rock, a paper boat. What floats? For how long?

Put a thermometer into hot water and watch the mercury rise.

Use a set of scales to weigh and balance rocks, cotton puffs, or beans.

Goals

(This unit will help to achieve these goals. It is good to have particular goals in mind, even if they seem to be long-range ones.)

An inquiring mind.

An awareness of nature.

A quickening of the five senses.

Growing knowledge about the earth.

Key Words

(A science lesson can be a vocabulary-building experience.)

rock	hard	
water	soft	
shell	rough	
soil	smooth	warm
sand	wet	cold
blue	taste	hear
red	tongue	ear
sour	smell	finger
sweet	nose	touch
salty	see	
	eye	

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week no. 2

THEME: Plants, Seeds, Flowers, Fruits

Some Understandings

There are four seasons.

Temperature and weather change with the seasons.

Some plants produce seeds.

Seeds differ in size, shape and color.

Seeds are distributed by wind, by man, and by other means.

Seeds produce the same kind of plant as the one they grew from.

Some seeds can be eaten.

Fruits and flowers contain seeds.

Spring is the planting season; summer, the growing season; autumn, the harvesting season.

Experiences

Seeds: Use seeds that are large enough for a child to handle and that germinate rapidly. Try timothy grass and radish (small, but fast sprouters), bean, pumpkin, corn or melon seeds. Have the children bring milk cartons from home to use as flower pots. Be sure that each child has one to himself. Planting will be a messy project; so plan to do it outdoors. It's a good idea to include two or three parents in the planting activity. Assemble everything you need before you begin; potting soil, pebbles for drainage at the bottoms of the pots, seeds, spoons (for shovels), and cut-off milk cartons. Prepare for a few failures. Over- or underwatering, diggings-up, or too-deep planting may result in a disappointed little gardener; so, plant a few extra pots yourself. The children will be eager for the first shoots to appear. Place a bean between wet cotton and the inside of a jar. The bean will sprout, and the children can see what is taking place in the milk cartons. If you used timothy seeds, place a few of them on a wet sponge in a dish. The seeds will sprout in a day or two.

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Experiences

Other Plant Life: A crowded classroom is a good place for a small indoor garden, called a terrarium. Here you can house several plants in a small space. In an aquarium or large glass jar, place potting soil, moss, tiny ferns, and other small plants. A glass top will keep the moisture in, but it isn't a necessity. Show the children how to prune the faster growing plants and how to root the prunings in water. Show them how the plants "follow" the sun, how some grow faster than others, and how to water them. Have a few potted plants in the room. Keep them low enough for the children to smell and touch. Geraniums and philodendron are inexpensive and hardy. Sweet potatoes will sprout in jars of water, showing root development as well as stem and leaf growth. Put a carrot top in a saucer of water. Explain that seeds, not carrots, grow from the green tops. Take a walk outdoors. Point out trees, weeds, grass, flowers. Look for different leaf-shapes, textures, colors, and sizes. Notice that weeds grow in unlikely, unexpected places, between bricks, along curbs, or through cracks in the sidewalk.

Goals

Some understanding of plant growth and reproduction.

An awareness of the cycle of seasons.

Key Words

spring	flower	leaf
summer	fruit	stem
autumn (fall)	temperature	rain
winter	thermometer	snow
seed	to plant	sky
pod	to harvest	cloud

THEME: Animals

Some Understandings

Living things need air, water, and food.

Some animals do helpful things (cows give milk, sheep give wool, birds eat insects, bees make honey).

People do helpful things for their animals.

Tame animals like people for company (dog, cat, rabbit).

Wild animals are timid with people (birds, squirrels).

Some wild animals are dangerous (bears, wolves).

Experiences

Letting the children feed and tend classroom pets provides an excellent opportunity for them to learn about caring and loving. Buy or borrow books on the care of the kinds of animals you choose to bring to school.

Indoor Pets: Puppies and kittens encourage the children to give and receive love. Never leave them alone in the classroom overnight. If care after school hours isn't available, consider a different animal. Some choices are turtles, terrapins, goldfish, gerbils, rabbits, worms, grasshoppers, tadpoles, guinea pigs, mice, snails, baby chicks, or an ant farm. What do the children observe?

Outdoor Pets: Place a bird feeder near a window where the children can see it easily. Let them take turns shopping for birdseed and pouring the seed out for the birds. Look carefully at the possibilities in your community. Can you arrange to visit a farm to see lambs, goats, or baby pigs? Is there a parent who would bring a young animal to school and tell about its care?

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Goals

An interest in and some knowledge about animals.

A sense of the relationship between man and animals.

Key Words

cat	bark	seed
purr	care	whisker
fossils	cage	tail
dog	bird feeder	fur
feather	wing	shell
hop		

Adapted from a rough draft of the Tuscumbia, Alabama, Head Start Program's Month-by-Month Teaching Guide.

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Adult Readings

Arnstein, Helene S. ***What to Tell Your Child About Birth, Illness, Death, Divorce and Other Family Crises.*** Indianapolis: Bobbs-Merrill, 1962. $1.50.

Association for Childhood Education International. ***Young Children and Science.*** Washington, D.C.: The Association, 1964. $1.25.

Beck, John M., and Saxe, R. W., comp. and ed. ***Teaching the Culturally Disadvantaged Pupil.*** Springfield, Illinois: Charles C. Thomas, Publisher, 1965. $10.50.

Black, Irma Simonton. ***Your Child and Sex.*** New York: Bank Street. $1.75.

Blough, Glenn O. Campbell, Marjorie H. ***Making and Using Classroom Science Materials in the Elementary School.*** New York: Holt, 1954. $2.75.

Brown, Vinson. ***How to Make a Home Nature Museum.*** Boston: Little, Brown, 1954. $2.50.

Carson, Rachel. ***The Sense of Wonder.*** New York: Harper, 1965. $5.11.

Child Study Association of America. ***Parents' Guide to Facts of Life for Children.*** New York: The Association, 1965. $0.75.

Craig, Gerald S. ***Science in the Elementary Schools.*** What Research Says to the Teacher, No. 12. Washington, D.C.: National Education Association, 1957. $0.25.

Hartley, Ruth E. ***The Complete Book of Children's Play.*** New York: Crowell, 1963. $6.50.

Haupt, Dorothy. ***Science Experiences for Nursery School Children.*** Washington, D.C.: National Association for the Education of Young Children. $0.75.

Hochman, Vivienne. ***Science Experiences in Early Childhood Education.*** Teachers Handbook Series. New York: Bank Street College of Education Publications. $0.75.

Kirkendall, Lester. ***Helping Children Understand Sex.*** Chicago: Science Research Associates, 1968. $1.00.

Kranzer, Herman. ***Nursery and Kindergarten Science Activities.*** Jenkintown, Pennsylvania: Prime-Ed Co. $2.75.

Leeper, Sarah Hammond. ***Nursery School and Kindergarten.*** What Research Says to the Teacher, No. 22. Washington, D.C.: National Education Association, 1968. $0.25.

Levine, M. I. Early Sex Education. ***Young Children,*** 1966, **22,** (1).

Library Journal. ***Growing Up with Science Books.*** New York: Bowker, 1963.

McDonald, M. Helping Children to Understand Death: An experience with death in a nursery school. ***Journal of Nursery Education,*** **19,** 1963.

Macrae, Donald. Astronomy Books for Children. ***Top of the News,*** 1962, 18 (May).

Noar, Gertrude. ***Teaching the Disadvantaged.*** What Research Says to the Teacher, No. 33. Washington, D.C.: National Education Association, 1968. $0.25.

Pitcher, Evelyn Goodenough. ***Helping Young Children Learn.*** Columbus, Ohio: Charles E. Merrill Publishing Co., 1966. $3.95.

Plank, Emma N. Young Children and Death. ***Young Children.*** 1968, **23,** (6).

Rasmussen, Margaret, Ed. ***Young Children and Science.*** Bulletin No. 12-A. Washington, D.C.: Association for Childhood Education International, 1964. $1.25.

Rieger, Edythe. ***Science Adventures in Children's Play.*** New York: The Play Schools Association, 1968.

Roeper, Annemarie and Parks, Marian. ***Physical Science in the Nursery School or Kindergarten.*** Bloomfield Hills, Michigan: Roeper City and Country School, 1968.

Ruchlis, Hy. ***Guide to Science Projects: 220 Suggestions for Science Projects.*** Brooklyn: Book-Lab, Inc., 1968. $0.25. (minimum order 5 copies.)

Sheckles, Mary. ***Building Children's Science Concepts: Experiences with Rock, Soil, Air and Water.*** New York: Bank Street, 1958. $1.50.

Silverblatt, Iris M. ***Creative Activities: A Manual for Teachers of Pre-School Children.*** Cincinnati: Creative Activities, 1964. $3.08.

Wickens, Elaine. ***Teaching About Life and Death.*** New York: Bank Street. $0.15.

Wills, Clarice. ***Kindergarten for Today's Children.*** Chicago: Follett, 1967. $6.00.

Wolf, Anna W. M. ***Helping Your Child to Understand Death.*** New York: Child Study Association of America, 1958. $0.85.

Woodcock, Louise P. ***Answering Children's Questions.*** New York: Bank Street. $1.75.

Zim, Herbert S. ***Science for Children and Teachers.*** Bulletin No. 91. Washington, D.C.: Association for Childhood Education International, 1953.

22

Books to Use With the Children

Ames, Gerald and Wyler, Rose. ***Food and Life.*** Minnesota: Creative Educational Society, 1966. $4.95.

Andry, Andrew C., and Schepp, Steven. ***How Babies are Made.*** New York: Time-Life Books, 1968. $3.95.

Asimov, Isaac. ***Beginning Science.*** Chicago: Follett, 1967.

Birnbaum, A. ***Green Eyes.*** New York: Golden Press, 1953. $3.50.

Black, Irma. ***Busy Water.*** New York: Holiday House, 1958. $2.50.

Black, Irma. ***New Baby Comes to Our House.*** New York: Bank Street. $1.75.

Blough, Glenn, O. ***Discovering Plants.*** New York: McGraw-Hill, 1966. $2.96.

Branley, Franklyn, and Vaughan, Eleanor. ***Mickey's Magnet.*** New York: Crowell, 1956. $2.50.

Branley, Franklyn M. ***The Sun: Our Nearest Star.*** New York: Crowell. $2.96.

Brown, Margaret Wise. ***The Diggers.*** New York: Harper & Row, 1960. $2.19.

Brown, Margaret Wise. ***The Seashore Noisy Book.*** New York: Harper & Row. $2.92.

Burt, Olive. ***Space Monkey.*** New York: John Day, 1960. $2.50.

Carr, Archie. ***The Reptiles: Life Nature Library.*** New York: Time-Life Inc., 1963.

Carson, Rachel. ***The Sea Around Us.*** New York: Golden Press, 1966. $6.95.

Conklin, Gladys. ***Lucky Ladybugs.*** New York: Holiday House, 1968. $4.50.

Cormack, Maribelle. ***The First Book of Stones.*** New York: Watts, 1950. $1.50.

de la Mare, Walter. ***Bells and Grass.*** (poems). New York: Viking, 1964. $4.00.

De Regniers, Beatrice Schenk, and Gordon, Isabel. ***The Shadow Book.*** New York: Harcourt, Brace and World, 1960. $2.75.

Downer, Mary L. ***The Flower.*** New York: William R. Scott, 1959. $1.59.

Engel, Leonard and ed. of LIFE. ***The Sea: Life Nature Library.*** New York: Time-Life Inc., 1963.

Ets, Marie H. ***Another Day.*** New York: Viking. $2.75.

Ets, Marie H. ***Just Me.*** New York: Viking, 1965. $2.75.

Ets, Marie H. ***Play with Me.*** New York: Viking, 1955. $2.75.

Ets, Marie H. ***The Story of a Baby.*** New York, Viking, 1966.

First Science Experiments. New York: Dutton, 1967. $3.22.

Flack, Marjorie. ***Tim Tadpole and the Great Bullfrog.*** Garden City: Doubleday, 1959. $2.75.

Follett Publishing Co. ***Beginning Science Books Series.*** Chicago: Follett, various dates. 40 Titles, $1.38 each; Entire Series, $55.20.

Gabrutson, I. N. ***Birds.*** New York: Simon and Schuster. $1.95.

Gay, Zhenya. ***What's Your Name?*** New York: Viking, 1955. $2.00.

Gay, Zhenya. ***Who is it?*** New York: Viking, 1957. $2.50.

Goudey, Alice E. ***The Day We Saw the Sun Come Up.*** New York: Scribner's. $3.12.

Green, Mary McBurney. ***Everybody Eats.*** New York: Scott, 1961. $2.00.

Green, Mary McBurney. ***Everybody Has a House.*** New York: Scott, 1961. $2.00.

Green, Mary McBurney. ***Is it Hard? Is it Easy?*** New York: Scott, 1960. $3.00.

Grey, Vivian. ***The First Book of Astronomy.*** New York: Watts, 1959. $1.95.

Gruenberg, Sidonie. ***The Wonderful Story of How You Were Born.*** Garden City: Doubleday, 1952. $2.95.

Hengesbaugh, Jane. ***I Live in So Many Places.*** Chicago: Childrens Press, 1956. $1.50.

Holsaert, Eunice, and Gartland, Robert. ***A Book to Begin on Dinosaurs.*** New York: Holt, Rinehart, and Winston, 1959. $2.50.

Hoover, Helen. ***Animals at My Doorstep.*** New York: Parents Magazine Press, 1966. $3.03.

Hutchins, Ross E. ***This is a Tree.*** New York: Dodd, Mead & Co., 1964. $3.23.

Hylander, Clarence J. ***The Macmillan Wild Flower Book.*** New York: Macmillan, 1954. $15.00.

Krasilovsky, Phyllis. ***The Very Little Girl.*** Garden City: Doubleday, 1953. $1.50.

Krauss, Ruth. ***The Growing Story.*** New York: Harper & Row, 1947. $3.25.

Leeming, Joseph and Nagle, Avery. ***Fun with Naturecraft.*** Philadelphia: Lippincott, 1964. $3.50.

Lenski, Lois. ***I Like Winter.*** New York: Walck, 1950. $2.50.

Lenski, Lois. ***Now It's Fall.*** New York: Walck, 1948. $1.00.

Lenski, Lois. ***On A Summer Day.*** New York: Walck, 1953. $2.50.

Lenski, Lois. ***Spring Is Here.*** New York: Walck, 1945. $0.75.

Levine, M. I. and Seligmann, J. H. ***A Baby is Born.*** New York: Golden Press, 1966. $2.95. (paper ed., $1.00.)

Life ed. staff. ***The World We Live In.*** New York: Golden Press, 1966.

Lionni, Leo. ***Swimmy.*** New York: Pantheon, 1963. $3.50.

MacDonald, Golden. ***The Little Island.*** Garden City: Doubleday, 1946. $2.50.

Martin, A. C. ***Flowers.*** New York: Simon and Schuster, 1949. $1.00.

Mayall, Robert N. ***Beginner's Guide to the Skies.*** New York: Putnam, 1960. $2.50.

McCormick, Jack. ***The Life of the Forest.*** New York: McGraw-Hill, 1966. $3.95.

Miles, Betty. ***A Day of Winter.*** New York: Knopf, 1961. $2.75.

Milgrom, Harry. ***Explorations in Science.*** New York: Dutton, 1963-66. $3.39.

Miller, Patricia K., and Seligman, Iran L. ***Big Frogs, Little Frogs.*** New York: Holt, Rinehart, and Winston, 1963. $1.95.

Morgan, Alfred. ***Aquarium Book for Boys and Girls.*** New York: Scribner's, 1959. $3.00.

Moore, Ruth. ***Evolution: Life Nature Library.*** New York: Time-Life Inc., 1964.

Nature Through Games. Harrisburg: Stackpole, 1967.

Ottam, Clarence. ***Insects.*** New York: Simon and Schuster, 1951. $1.00.

A Pet Book for Boys and Girls. New York: Scribner's, 1949. $3.63.

Podendorf, Illa. *One Hundred and One Science Experiments*. Chicago: Childrens Press, 1960. $3.38.

Politi, Leo. *The Butterflies Come.* New York: Scribner's, 1957. $2.75.

Rand, Ann. *I Know a Lot of Things.* New York: Harcourt, Brace and World. $3.60.

Rowand, Phyllis. *It Is Night.* New York: Harper & Row. $2.92.

Russell, Solvieg Paulson. *What Good Is a Tail?* Indianapolis: Bobbs-Merrill, 1962. $2.50.

Sanderson, Ivan T. *The Continent We Live On.* New York: Random House, 1962. $4.99.

Schlein, Miriam. *Fast Is Not a Ladybug.* New York: Scott, 1953. $1.75.

Schlein, Miriam. *Heavy is a Hippopotamus.* New York: Scott, 1954. $2.75.

Schlein, Miriam. *Here Comes Night.* Chicago: Whitman, 1957. $2.00.

Showers, Paul, and Aliki. *The Listening Walk.* New York: Crowell. $2.96.

Skaar, Grace. *All About Dogs, Dogs, Dogs.* New York: Scott. $3.50.

Tresselt, Alvin. *Rain Drop Splash.* New York: Lothrop, Lee & Shepard, 1946. $1.50.

Tresselt, Alvin. *White Snow, Bright Snow.* New York: Lothrop, Lee & Shepard, 1947. $2.00.

Udry, Janice May. *A Tree Is Nice.* New York: Harper & Row, 1956. $3.25.

UNESCO. ***700 Science Experiments for Everyone.*** Garden City: Doubleday, 1962. $4.00.

Watson, Jane Werner. ***Wonders of Nature.*** New York: Golden Press, 1958. $1.00.

Zim, Herbert S. and Baker, Robert H. ***Stars.*** New York: Golden Press, 1956. $1.95.

Zolotow, Charlotte. ***The Storm Book.*** New York: Harper & Row, 1952. $2.95.

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We are listing equipment suppliers and lesser known publishers separately, on page 30. These will offer items which you may have to order directly, rather than through a trade wholesaler. Catalogs and descriptive information can be obtained from every address listed in these pages.

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